

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ANDERS BERGQVIST,
LARS O. LARSSON,
and
ERIK NILSSON

Appeal No. 1998-2077
Application No. 08/553,324

ON BRIEF

Before WARREN, LIEBERMAN, and KRATZ, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner refusing to allow claims 1 through 25, which are all the claims pending in this application.

THE INVENTION

The invention is directed to a method of treating paper pulp sequentially with ozone, a chelating agent and a peroxide. The method precludes any intervening washing step

between the ozone treating step and the chelating agent treatment. Other features are described in the illustrative claim below.

THE CLAIM

Claim 1 is illustrative of appellants' invention and is reproduced below:

1. Method of treating chemical paper pulp comprising the steps of:

adjusting the pH of the pulp to be between 1 and 6;

treating the pulp with ozone to reduce the kappa number of the pulp;

treating the pulp with a chelating agent after the ozone treating step without any intervening washing step between the ozone treating step and the chelating agent treating step;

adjusting the pH of the pulp by adding alkali together with or after the addition of chelating agent to a pH exceeding 3;

washing the pulp; and

bleaching the pulp with peroxide.

THE REFERENCES OF RECORD

As evidence of obviousness, the examiner relies upon the following references:

Lundgren et al. (Lundgren)	5,310,458	May 10, 1994
Lindberg	5,401,362	Mar. 28, 1995
Backlund et al. (Backlund)	5,415,734	May 16, 1995

THE REJECTION

Claims 1 through 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Backlund in view of Lundgren and Lindberg.

OPINION

The Rejection under 35 U.S.C. § 103(a)

We have carefully considered all of the arguments advanced by the appellants and the examiner, and agree with the appellants that the rejection over Backlund in view of Lundgren and Lindberg under § 103(a) is not well founded. Accordingly, we reverse this rejection.

“[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability,” whether on the grounds of anticipation or obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). On the record before us, the examiner relies upon a combination of three references to reject the claimed subject matter and establish a prima facie case of obviousness.

In our discussion below, we rely on the same notation utilized by both the appellants and the examiner in their discussion of the rejection of record. Accordingly, Q stage = chelating agent stage, P stage = peroxide bleaching stage, and Z stage = ozone bleaching stage. Based upon the above designation, we designate the sequence required by the claimed subject matter as being ZQP without any intervening washing step between Z and Q.

We find that Backlund discloses bleaching pulp in the absence of chlorine. See column 1, lines

7-8. In contrast to the sequence required by the claimed subject matter, the process of Backlund comprises first treating delignified pulp with a chelating agent such as EDTA. See column 1, lines 26-28. Thereafter, the pulp is bleached with hydrogen peroxide, followed by a treatment with ozone. See column 1, lines 33-36, column 2, lines 7-10, and 23-26. An additional peroxide stage may follow the ozone treatment. See column 2, lines 38-40. This sequence in the process is designated as QPZ or QPZP. See column 2, lines 45, 49, and 55-56. Backlund teaches that washing occurs after each treatment stage. See column 3, lines 42-59 and claim 1. We conclude that this sequence is distinct and different from that of the claimed subject matter.

Similarly, we find that Lundgren describes a process for treating delignified pulp with a chelating agent followed by a peroxide treatment. See Abstract, and column 1, lines 7-11, and column 3, lines 30-44. The complexing agent among others includes EDTA. See column 3, lines 58-63. Washing is disclosed between the stages Q and P. See Example 4. The process may be designated as QP. There is, however, neither a disclosure nor a suggestion for the utilization of ozone or an ozone treatment at any stage in Lundgren.

As to Lindberg, we find that Lindberg discloses a method for bleaching pulp without using chlorine chemicals. See column 1, lines 9-12. The method comprises removing transition metals from the pulp by (a) treating the pulp with an ozone stage or a chelation stage. See column 2, lines 11-20 and 29-34. The treated pulp is thereafter washed. Id. See also claim 1. The sequence outlined in the detailed description of the drawings is a chelating stage, followed by washing, followed by bleaching, or

in the alternative, an ozone stage followed by washing, followed by bleaching. This sequence may be designated as QP or ZP. See column 3, lines 45-65. We find that alternative sequences are further disclosed wherein, “a ZEZP sequence may be utilized (the E stage may be an E_{op} stage), with or without a chelating stage before the first Z stage.” See column 4, lines 6-8. However, the addition of a Q stage results only in the sequence QZEZP.

It is the examiner’s position that it would have been obvious to further chelate any remaining transition metals prior to the washing and peroxide stage and subsequent to the ozone stage in Backlund. See Answer, page 4. However, on the record before us, we determine that there is no motivation, suggestion or evidence to further chelate remaining transition metal ions in accordance with the examiner’s suggestion.

In addition, the examiner relying on Lindberg, column 2, lines 29-31, argues that it would have been prima facie obvious to have the ozone and chelation steps in any order. Thus the chelation step of Lundgren could follow the ozone stage of Backlund as both steps perform the same function of removing transition metal ions as taught by Lindberg. See Answer, page 4. The portion of Lindberg, relied upon reads, “[s]tep (a) may be an ozone stage, or a chelation stage (such as an EDTA stage, an acid only stage, or a combination EDTA and acid stage).” The examiner accordingly finds that there is a teaching of equivalency between the ozone stage and the chelation stage for the purpose of removing transition metal ions. However, notwithstanding this teaching, this record fails to provide the requisite suggestion or motivation to modify the QPZ sequence disclosed by Backlund to obtain the ZQP

sequence of the claimed subject matter, even if Z and Q are equivalent. We conclude that Lindberg's suggestion of the equivalency of ozone and chelating agents would not teach the person having ordinary skill in the art to use ozone and chelating agents sequentially.

Based upon the above considerations, even if the examiner was correct in combining Backlund, Lundgren, and Lindberg in the manner described supra, the requisite sequence of steps and the concomitant omission of a washing stage between the ozone stage and the chelation stage would not be taught and the process created would, in any event fall short of the invention defined by the claimed subject matter, as the aforesaid claimed subject matter requires features that cannot be achieved by combining the three references. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 1051, 5 USPQ2d 1434, 1438 (Fed. Cir.), cert. denied, 488 U.S. 825 (1988). Accordingly, the examiner has not established a prima facie case of obviousness.

Appeal No. 1998-2077
Application 08/553,324

DECISION

The rejection of claims 1 through 25 under 35 U.S.C. § 103(a) as being unpatentable over Backlund in view of Lundgren and Lindberg is reversed.

The decision of the examiner is reversed.

REVERSED

PAUL LIEBERMAN
Administrative Patent Judge

PETER F. KRATZ
Administrative Patent Judge

)
)
)
) BOARD OF PATENT
) APPEALS
) AND
) INTERFERENCES
)
)

PL

WARREN, *Administrative Patent Judge*, Dissenting:

I respectfully disagree with the decision of a majority of this panel to reverse the decision of the examiner because I am of the opinion that the claimed methods encompassed by the appealed claims would have been obvious under 35 U.S.C. § 103 over the combined teachings of Backlund, Lundgren and Lindberg to one of ordinary skill in this art at the time the claimed invention was made, for the following reasons.

In giving the terms of the claims the broadest reasonable interpretation consistent with appellants' specification as it would be interpreted by one of ordinary skill in this art, *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997), I find that the plain language of claim 1 makes it clear that the claimed method comprises the steps of adjusting chemical paper pulp to a pH of between 1 and 6, subsequently treating the pulp with ozone to reduce the kappa number thereof, immediately thereafter treating the pulp with a chelating agent without an intervening washing step, adding an alkali to the pulp with or after the addition of the chelating agent to attain a pH exceeding 3, subsequently washing the pulp at some point, and further subsequently bleaching the pulp with peroxide at some point. In the shorthand notation used by the panel (see above pp. 3-4), appellants (brief, pages 7-8; reply brief, page 2) and the references,¹ the claimed method encompassed by claim 1 "comprises" at least the sequence (ZQ) at some point in the method of treating chemical paper pulp followed at some later point in the process by a washing step and then at a further latter point b a P stage, that is, at least (ZQ)P. *See In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) ("As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term 'comprises' permits the *inclusion* of other steps, elements, or materials."); *cf. Exxon Chemical Patents Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) ("The claimed composition is defined as comprising - meaning containing at least - five specific ingredients."). Claim 23 differs from claim 1 in that the pH adjustments and the specific

¹ See, e.g., Backlund, e.g., col. 2, lines 7, 9 and 24; Lindberg, e.g., col. 2, lines 28-33. I note that the "E stage" in Lindberg, col. 2, line 33, is disclosed in Lundgren, col. 2, lines 56-57, as "E = alkali extraction stage," and that the "T stage" in Lindberg is the "chelating stage" (col. 3, line 60, and col. 4, line 31) which is represented by "Q" in the other references. Appellants use parenthesis, as in "(ZQ)," to indicate the absence of a wash step between the enclosed stages.

washing step are not present. Thus, only one of the bleach sequences, “(ZQ)P,” set forth by the examiner (answer, page 5) represents the requirements of claims 1 and 23. Appellants also point to, *inter alia*, claims 20, 21 and 22,² of which claims 21 and 22³ respectively require that “(ZQ)” “is an initial bleaching stage after oxygen delignification” and that the Z stage “precedes all peroxide bleaching stages,” the later including, for example, “(ZQ)PZP,” while claim 20 requires that “alkali is added together with said chelating agent to said pulp.”

Turning now to the prior art applied by the examiner, I find that each of Backlund, Lundgren and Lindberg is directed to bleaching methods that do not use chlorine or chlorine containing compounds in the bleaching process. I find that Backlund discloses that, after oxygen-delignification, the pulp is treated in a Q stage using sulfuric acid, then in a P stage using NaOH, then in a Z stage using sulfuric acid and, optionally, then with a P stage using NaOH; in sum, the bleaching sequences QPZ and QPZP with each of the three or four stages separated by a washing step, which step is particularly emphasized after treatment in the Q stage, and the pH of each of the stages is adjusted as required (e.g., col. 1, lines 7-41; col. 3, line 36, to col. 6, line 7; col. 6, lines 36-48; col. 8, line 20, to col. 9, line 28; and Example 2).

Backlund describes the prior art (col. 1, line 65, to col. 2, line 68), in similar manner to

² I have considered independent claims 1 and 23 as well as claims 20 through 22, the latter three dependent on claim 1, from the groups set forth by appellants (brief, page 7) as explained by the examiner pursuant to an interview held with appellants subsequent to the filing of the brief (answer, page 2; see the Interview Summary, November 21, 1997, Paper No. 14). 37 CFR § 1.192(c)(7) (1997).

³ In the amendment of January 21, 1997 (Paper No. 6), appellants submitted claims 22 and 25 (“said ozone treatment step *precedes all* peroxide bleaching stages” (emphasis supplied)), taking the position that these claims find support “at specification page 4, lines 31-32, the language ‘bleaching sequence is *initiated* with ozone’ means that the ozone is the *initial* step” (page 6; emphasis supplied). The difficulty with appellants’ position is, of course, that any Z stage subsequent to the *initial* Z stage in the sequence (ZQ)P which is prior to a second or subsequent P stage, such as in the sequence (ZQ)PZP, is *not* the disclosed “initial step” ozone stage or claimed “said ozone stage.” Thus, the examiner should consider whether claims 22 and 25 satisfy the provisions of 35 U.S.C. § 112, first paragraph, written description requirement. The claims must, of course, be examined with respect to § 103 even if they are not supported by the specification as filed as required by § 112, first paragraph, written description requirement. *See Ex parte Grasselli*, 231 USPQ 393 (Bd. Pat. App. & Int. 1983), *aff’d mem.*, 738 F.2d 453 (Fed. Cir 1984).

the description thereof in appellants' specification (pages 2-4), including the affect of each of the Q, P and Z stages with respect to the bleaching sequences QPZ and QPZP, on paper brightness, particularly noting that in using the Z stage, the "lignin content of the pulp is decreased . . . [which] is important since a pulp bleached with only peroxide or oxygen/peroxide still contains a relatively high content of lignin, which affects the brightness revision tendency of the pulp" (col. 2, lines 22-34), and appellants acknowledge that a reduction in lignin content is reflected in a reduced kappa number (specification, pages 2-3). Backlund further states, with respect to the prior art, that it has been shown that "an ozone stage after a peroxide stage increases the brightness of sulphite pulp," that if "a peroxide stage is allowed to follow the ozone stage, a further increase in brightness is obtained," and that "this is also the case for sulphate pulp" (col. 2, lines 35-41). In this respect, both appellants (specification, pages 1-2) and Backlund (col. 2) refer to the "LIGNOX" bleaching method in "SE-A-8902058," which foreign patent document appears to correspond to Lundgren, wherein the bleaching method has the bleaching sequence QP, and both describe other known bleaching methods in which the bleaching sequence of "LIGNOX" was expanded to the sequences QPZ and QPZP to increase brightness.

I find that Lundgren discloses that the Q stage is carried out under "neutral conditions," that is, at a pH of 3.1 to 9.0,⁴ and the P stage is carried at an alkaline pH, with the sequence QP being preferably used "where the bleaching sequence comprises an oxygen [delignification] stage . . . either immediately after the delignification of the pulp, i.e., before an optional oxygen stage, or after the oxygen stage," and with "a washing stage between the two treatment stages, such that the complex bound metals are removed from the pulp suspension before the peroxide stage" (col. 1, lines 7-22, and col. 3, line 17, to col. 5, line 66). While Lundgren teaches that the pH of the Q stage should be adjusted, the reference does not specifically disclose or claim how that must be accomplished, but does disclose the use of acid for that purpose (col. 4, lines 30-32).

Similarly, the use of alkali in the P stage is disclosed. With respect to the expanded bleaching sequences QPZ and QPZP based on this process known in the art as discussed above, I find that the reference further discloses that "after this two-step treatment, the pulp may be subjected to a final bleaching to obtain the desired brightness" (col. 4, lines 2-4). Lundgren further teaches that when "using

⁴ I note that Lindberg discloses that transition metals "precipitate out as solids if the pH is raised so that the liquid containing the dissolved metals is sufficiently alkaline. Typically if the pH is greater than 9, and preferably above 10.5, the metals precipitate out and can be readily filtered" (col. 1, lines 27-33).

two oxygen stages after one another at the beginning of a bleaching sequence[,] . . . after an initial oxygen treatment, it is difficult to use a repeated oxygen treatment to remove such amounts of lignin [sic] that the high investment costs for such a stage are justified,” and that “a first step with only a complexing agent being added under neutral conditions results in a considerable reduction principally of the metals most detrimental to the decompositions of hydrogen peroxide” (col. 5, lines 4-45). Lundgren also states that “in a bleaching process, the aim is a low kappa number, which means a low content of undissolved lignin, and a high brightness of the pulp” (col. 5, lines 59-62).

I find that Lindberg also recognizes the problem that transition metal ions affect Z and P stages and discloses a method to remove such metals from treatment fluids, the two steps of interest here being “(a) [t]reating digested pulp in an acidic or neutral stage to dissolve transition metals” and “(b) [w]ashing the pulp after step (a) to produce a filtrate containing dissolved transition metals” (e.g., col. 1, lines 7-20, and col. 2, lines 14-17). The reference discloses that “[s]tep (a) may be an ozone stage, or a chelation stage (such as an EDTA stage, an acid only stage, or a combination EDTA and acid stage)” (col. 2, lines 28-30), which would have taught one of ordinary skill in this art that the “an ozone stage” will dissolve transition metals in the pulp and that the chelating agent EDTA can be used in acid or neutral conditions. The position of the “step (a)” Z stage or Q⁵ stage in the process is shown by the disclosure that “[a]fter [wash] step (b) the pulp may be further treated in at least one Z bleach stage [sic] at least one P bleach stage, and also preferably in at least one E stage” (col. 2, lines 30-33; *see above* note 1). Such a sequence is shown in Lindberg FIG. 1 where QPZP has a washing step between each of the stages (col. 3, line 45, to col. 4, line 35). Lindberg discloses that “[a] number of modification may be made to the bleaching sequence,” and provides such examples as ZEZP and QZEZP, that is, either a Z or a Q stage is the *initial* stage following oxygen delignification, further stating that “a wide variety of other bleaching sequences may be utilized” (col. 4, lines 4-10). Lindberg further discloses that the method thereof can be used with “any (or more than one) acidic stages, such as shown at 31’ in FIG. 1 (there associated with a Z stage)” (col. 4, lines 32-34; *see also* col. 6, lines 4-6). I find that one of ordinary skill in this art would have readily distinguished the acidic Z bleach stage at a later point in the process of Lindberg from the acidic Z stage or “ozone stage” disclosed to dissolve metal ions from digested pulp in the *initial* stage or “step (a)” of the bleaching sequence, even though this person

For consistency, I refer to “T” in Lindberg as “Q” (*see above* note 1).

would have recognized that the use of any ozone step in a bleaching process is an acidic step. See, e.g., Backlund, col. 3, lines 55-56.

I find that one of ordinary skill in this art would have found in or inferred from the combined teachings of the applied references, as discussed above, the affect of each of the Q, P and Z stages, separately and alternatively positioned in sequences, and any intervening washing steps, on oxygen delignified pulp⁶ at different points in bleaching sequence. Indeed, it would have been apparent from the discussion of the prior art by Backlund and appellants, that one of ordinary skill in this art would have known that the sequence QP, with and without an intervening washing step, was the LIGNOX process of Lundgren and that it can be expanded to the sequences QPZ and QPZP, both of which are shown to be alternative in Backlund and found among the sequences taught in Lindberg. It would have been further apparent that the Q stage can be conducted under either acid conditions, as seen from Backlund and Lindberg, and under neutral conditions, as seen from Lundgren and Lindberg, and that this stage is advantageously used prior to a P stage in order to diminish, if not remove, the deleterious effect of transitional metal ions on the peroxide, as seen in all three references. The references establish that it was further known in the art that a Z stage, conducted under acid conditions, further delignifies the pulp with certain advantageous results and generally follows the first P stage, and in turn is followed by a second P stage.

One of ordinary skill in this art would have further found in Lindberg the teaching that a Z stage may be the initial stage in a bleaching sequence following oxygen delignification with the affect of dissolving transition metal as an alternative to the use of a Q stage conducted under acid or neutral conditions for the same purpose. I find that this person would also have found in the disclosure of the exemplary bleaching sequences ZEZP and QZEZP in Lindberg an example of a Z stage as the initial stage and would have reasonably inferred from the latter sequence that the two stages, Q and Z, each also disclosed as separately used as the initial stage of the bleaching sequence following oxygen delignification, can be used sequentially and accomplish the purpose of dissolving metals from the pulp, as this person would have expected that using a following Q stage would also chelate the metal ions dissolved from the pulp in the Z stage. The use of a Z stage as the initial stage of the bleaching sequence

⁶ While the focus here has been on oxygen delignified pulp, as in claim 21, it is apparent that one of ordinary skill in the art also had knowledge of the effect on non-oxygenated pulp as well. See, e.g., Lundgren, col. 5, lines 47-66.

would also have been reasonably expected by one of ordinary skill in this art to result in further delignification of the pulp and accompanying reduction in the kappa number of the pulp, characteristic of this stage, at this point in the sequence. In this respect, Lundgren would have reasonably suggested that a second successive stage using oxygen can be used in a bleaching sequence that begins with oxygen delignification. I find that one of ordinary skill in this art would have recognized from the references that the purposes of the washing steps between the stages in the bleaching sequences are the removal of materials used in and resulting from a bleaching stage from the pulp, such as complex bound metals, thus preparing the pulp to receive materials during the next bleaching stage, and for control of the material thus used in and generated in the bleaching process. Indeed, Lindberg teaches that washing “step (b)” follows the step of dissolving the transition metals in “step (a).”

In comparing the claimed method encompassed by the appealed claims considered here (*see above* note 2) with the combined teachings of the prior art as discussed above, it is apparent that the principal issue with respect to whether the examiner has made out a *prima facie* case of obviousness, is whether one of ordinary skill in this art would have found in the combined teachings of the applied references the reasonable suggestion to use a Z stage followed by a Q stage, without an intervening washing step, as the initial stages to be followed by a P stage in a bleaching sequence for oxygen delignified pulp, with the reasonable expectation of affecting the kappa number and thus the brightness of the pulp. The examiner points out that Lindberg teaches that either the Z stage or the Q stage can be used as the initial stage to remove metal ions and that the Z stage would be the first bleaching stage in the bleaching sequence even in the sequence QZEP (answer, page 4). I additionally found above that this sequence, when compared to the sequence ZEP, further would have reasonably suggested that the two stages, Z and Q, taught by Lindberg for the purpose noted by the examiner, could be sequentially used in a sequence, and Lindberg does teach that the Z stage can be the initial stage in the bleaching process. Indeed, the Z stage would additionally perform the function of further delignifying the pulp, thus lowering the kappa number and increasing the brightness, regardless of the position of this step in the sequence, as shown by the references.

Thus, based on this evidence, I agree with the examiner that, *prima facie*, one of ordinary skill in this art would have reasonably found in Lindberg the suggestion that the Z stage can precede the Q stage to be followed by a P stage in a bleaching sequence with the reasonable expectation that the pulp

would be affected with respect to the presence of transition metal ions and further delignified, and thus would have reasonably found in the combined teachings of the references the suggestion to modify the bleaching sequences QPZ and QPZP that were will known in the art by inserting a Z stage as the initial stage prior to the Q stage, thus arriving at the sequences, *inter alia*, ZQPZ and ZQPZP, encompassed by the claimed processes encompassed by claim 23. I further agree with the examiner (answer, pages 4 and 5-6) that, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of the references the further suggestion that a washing step need not be used between the Z and Q stages because both stages are taught by Lindberg to affect the presence of the transition metal ions. Indeed, the removal of such ions dissolved from the pulp by successive stages in one washing step would be efficacious with respect to the treatment of washing filtrates, which is an objective of those of ordinary skill in this art as evinced by the applied references, such as the processing of the filtrate from washing “step (b)” that follows the step of dissolving the transition metals in “step (a)” in Lindberg.

With respect to claim 1, which differs from claim 23 in further requiring that the pulp is adjusted to a pH exceeding 3 by adding alkali with of after the addition of the chelating agent in the Q stage, the addition of the alkali with the chelating agent specified in claim 20, Lundgren teaches the use of a chelating agent at a pH of 3.1 up to 9.0 and Lindberg teaches the use of the chelating agent EDTA with and without acid. Accordingly, *prima facie*, one of ordinary skill in this art would have found in these references the suggestion to use the chelating agent EDTA at a pH exceeding 3 as required by the claim, and would further have used an alkali to achieve this result by routine experimentation (see answer, page 6) as neither reference specifies how the pH of 3.1 up to 9 must be arrived at. With respect to claim 21, it is apparent that each of the applied references discloses methods employing oxygen delignified pulp. With respect to claim 22, as pointed out above, a Z stage was used before a second P stage in the bleaching sequences of Backlund and Lindberg, as well as in the extension of the process of Lundgren known in the art, as described by Backlund and acknowledged by appellants, as found above, which references make it clear that the advantage of a Z stage preceding a P stage is increased brightness.

Accordingly, based on this evidence, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of the references the clear suggestion that an acid Z stage followed by a Q stage with the addition of alkali, without intervening washing step can be used as the initial sequence to be followed by a P stage in a bleaching sequence for oxygen delignified pulp, resulting in the sequences,

inter alia, ZQPZ and ZQPZP, falling within the appealed claims, with the reasonable expectation of reducing the kappa number of the pulp, thus increasing the brightness thereof. *See In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) (“The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have reasonable likelihood of success, viewed in the light of the prior art.”); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *In re Fortress*, 639 F.2d 1009, 1017, 152 USPQ 13, 19 (CCPA 1966) (“Although we grant that there is no specific suggestion in either reference to combine [one step] with the other step, we do not think it required in the circumstances of this case where both steps are taught to be part of the standard fund of modifications in the art, and the two steps do not coact in some mutually dependent way. The independence of the steps is evidenced, too, by the fact that they may be performed in any sequence, and that change in the control parameters of one does not appear to call for a critical change in any of those of the other – each is relatively separate and independent.”).

I have carefully considered all of appellants’ arguments presented in their brief and reply brief, and the evidence in the specification as relied on therein, in rebuttal to the *prima facie* case made out by the examiner in again assessing the patentability of the claimed invention as a whole based on the record as a whole, including all the evidence of obviousness and of nonobviousness. *See generally, In re Piasecki*, 745 F.2d 1468, 1472-73, 223 USPQ 785, 788 (Fed. Cir. 1984).

With respect to the teachings of the references, appellants submit that “Lindberg does not teach that ozone and a chelating agent work in the same manner,” alleging that the reference “teaches only that the step (a) can be an ozone stage or a chelation stage,” at col. 2, lines 29-31, which are known to have different functions, and that it is appellants who “have now found that the ozone stage can release new metals from the pulp into solution” (reply brief, pages 3-4; see also brief, pages 11 and 14).

On this record, I find little merit in appellants’ position. It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would

have reasonably been expected to draw therefrom, see *In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985). The plain language of Lindberg pertinent here is the clear disclosures “[step] (a) Treating digested pulp in an acidic or neutral stage to dissolve transition metals” (col. 2, lines 14-16) and “[s]tep (a) may be an ozone stage, or a chelation stage (such as an EDTA stage, an acid only stage, or a combination EDTA and acid stage)” (col. 2, lines 28-30), which language also appears in claims 1 and 10 of this United States Patent. Appellants have not established by scientific reasoning or evidence that one of ordinary skill in the art armed with knowledge in the art would have clearly considered this plain language in the specification of Lindberg to constitute error, that is, that this person would not have recognized from the reference that “an ozone stage” is “an acid . . . stage” that dissolves the transition metals in pulp, and thus would have reasonably considered Lindberg to be non-enabling in this respect. The burden of proving non-enablement of such disclosure is not insubstantial as there is a strong presumption of validity respecting the disclosure and claims of a United States Patent. See 35 U.S.C. § 282 (1995). Indeed, appellants’ mere contention that it is they who have discovered the additional function of “an ozone stage” as dissolving metals from pulp clearly does not carry the burden. Thus, on this record, Lindberg provides an enabling disclosure, placing the use of “an ozone stage” at the beginning, or initial stage, of the bleaching sequence for the purpose of dissolving metals in pulp in the possession of the public. See, e.g., *In re Payne*, 606 F.2d 303, 314, 203 USPQ 245, 255 (CCPA 1979).

I do agree with appellants that the Z stage and the Q stage do not function in the same manner (brief, pages 11-13 and 16-18; reply brief, page 4), which is obvious from the reagents involved. However, this is not to say that these stages do not achieve the same purpose of dissolving metals in the pulp as taught in Lindberg. Furthermore, I cannot agree with appellants’ argument that “[t]here is no basis for the [examiner’s argument] that a prima facie case is made for the use of ozone and chelation stages in any order” from the disclosure of Lindberg, and thus the examiner is “relying on hindsight gleaned from the present specification, and/or unfounded speculation” (*id.*). While I agree with appellants that Lindberg discloses that “[s]tep (a) may be an ozone stage, *or* a chelating stage” (col. 2, line 28; emphasis supplied), and does not specifically disclose the sequence ZQP as part of a bleaching

sequence, I cannot agree that one of ordinary skill in this art would not have found in the disclosure of this reference a suggestion of such a sequence for the reasons that I have given above (*see above* pp. 11-13). Indeed, as I discussed above, it is apparent that the Q and Z stages are used sequentially in the sequence QZEP, disclosed in Lindberg as an example of one of “[a] number of modification [that] may be made of the bleaching sequence according to the invention” (col. 4, lines 4-10), which disclosure taken with the further disclosure that either of these stages can be the initial stage in the bleaching sequence for the same purpose of dissolving metals from the pulp, would have reasonably suggested to one of ordinary skill in this art that the Z stage, as the initial stage, can be sequentially followed by a Q stage in the bleaching sequence. Thus, the suggestion of the basic claimed sequence (ZQ)P would have been found by one of ordinary skill in this art, armed with the knowledge in the art as seen from the combined teachings of the references, in the teachings of Lindberg and not in appellants’ disclosure.

For similar reasons, I must disagree with appellants’ position that “the Examiner’s argument that it would have been obvious to wait until both metal dissolving stages are complete before washing the pulp is based on hindsight reasoning gleaned from the present specification and is without support in the cited references” which is also based on the difference in function between the Z and Q stages in dissolving metal ions from the pulp (reply brief, page 4). As I discussed above (*see above* page 14), an objective of one of ordinary skill in this art is to control wash filtrates and Lindberg discloses such control in the processing of the wash filtrate after dissolving the metal ions in the pulp. Thus, the suggestion to avoid a washing step until completion of treating the pulp to dissolve the metals would have been found by one of ordinary skill in this art, armed with the knowledge in the art as seen from the combined teachings of the references, in the teachings of Lindberg and not in appellants’ disclosure.

Therefore, the record does not support the inference that the examiner indulged in hindsight by relying on appellants’ specification to establish a *prima facie* case of obviousness in either of these respects. *See Dow Chem., supra; Keller, supra; Fortress, supra.*

I have considered appellants’ arguments with respect to claims 20 through 23 (brief, pages 15-18) but remain of the opinion expressed with respect to these claims above.

Turning now to the evidence in the specification relied on by appellants in the brief, appellants allege that the evidence in specification Example 1 establishes “unexpectedly results” in comparing “Method 1 . . . [utilizing the] QZP bleaching sequence which is similar to the method disclosed in

Backlund” and “Method 2 . . . [utilizing the] (ZQ)P method according to the present invention” since “claimed Method 2 produced a pulp having a significantly lower Kappa number, a significantly higher brightness, and significantly higher viscosity than pulp produced using the conventional Method 1 (Backlund)” (brief, pages 13-14). Appellants also contend that “Method 1” involves “the sequence QZP of Lindberg” and that “Backlund and Lindberg teach the method steps QZP” (reply brief, pages 3 and 5). Appellants further allege that the evidence specification Example 2 establishes “unexpected advantages” for the method of claim 20 wherein an “alkali is added together with” the chelating agent as seen in the comparison of “Alt. 2 . . . with Alt. 1 and 3” in which “Alt. 2 resulted in a pulp having a significantly reduced concentrations of” metal ions (brief, page 15).

It is well settled that the burden of establishing the significance of data in the record, with respect to unexpected results or for other purposes, rests with appellants, which burden is not carried by mere arguments of counsel. *See generally In re Geisler*, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365-66 (Fed. Cir. 1997); *In re Merck & Co.*, 800 F.2d 1091, 1099, 231 USPQ 375, 381 (Fed. Cir. 1986); *In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651-52 (Fed. Cir. 1985); *In re Borkowski*, 505 F.2d 713, 718, 184 USPQ 29, 33 (CCPA 1974); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972); *In re D’Ancicco*, 439 F.2d 1244, 1248, 169 USPQ 303, 306 (CCPA 1971). In my view, appellants have not carried their burden.

I find that in specification Example 1 “oxygen-delignified sulphate pulp . . . was treated in accordance with a previously known procedure using chelating agent prior to the ozone stage, and . . . in accordance with the invention, where chelating agent was added directly after the acid ozone stage,” after which “the pulp was peroxide-bleached in a similar manner in both cases,” wherein a reference to the “known procedure” was not supplied (page 6). The sequence for “known” Method 1 is “Stage 1”: stage Q (pH 5.8), stage Z (H₂SO₄, pH 3), and then a “charge of NaOH” (pH not indicated; amount of NaOH is more than twice that of Method 2); and “Stage 2”: stage P (MgSO₄, “final pH 10.9”); in sum, QZ(NaOH)P. The sequence for Method 2 is “Stage 1”: stage Z (initial pH 4.5, “charge of H₂SO₄” and resulting pH 3), and stage Q (“charge of NaOH,” pH not indicated); “Stage 2” is stage P (MgSO₄, “final pH 10.7”); in sum ZQP (pages 7-8). There is no information provided with respect to any washing steps, although it appears that a wash step would be included *after* multi-stage “Stage 1” and *after* single stage “Stage 2.” The Kappa number, Brightness and Viscosity data reported for Method 1 is 4.2,

71 and 695, and for Method 2 is 2.7, 85 and 703 (page 8). I find that in specification Example 2, “Oxygen-bleached soft wood pulp was acidified to pH 3” after which the chelating agent EDTA was added before (Alt. 3, “NaOH Q”), with (Alt. 2, “Q + NaOH;” see claims 1 and 20) or after (Alt 2, “Q NaOH;” see claim 1) “NaOH,” followed by a washing step (page 8). This Example thus involves stage Q as the *sole* stage of the test method. The reported data shows that the greatest amount of all metals is removed in Alt. 2, and then to a lesser extent in Alt. 1., which, including “Fe” (“15” vs. “16”), removes more metals than Alt. 3.

It is apparent that the comparison in specification Example 1, based on the overall sequences (QZ and then a “charge of NaOH”)P in Method 1, representing “a previously known sequence,” and (ZQ)P in Method 2, representing the appealed claims, wherein the “known” sequence has the additional step of a “charge of NaOH” at twice the amount used in Method 2, is not based on the closest prior art sequences, that is, QPZ and QPZP, as specifically disclosed in Backlund and Lindberg, and otherwise known in the art as set forth above. Indeed, appellants merely allege that the sequence QZP “is similar to the method disclosed in Backlund” (brief, page 13), is “disclosed in Lindberg” (reply brief, page 3) and taught in “both Backlund and Lindberg”(*id.*, 5). However, contrary to appellants’ contention, this sequence is not found *per se* in Backlund or Lindberg, although it may be said to be within the scope of the disclosure in Lindberg. In any event, the closest sequences to the claimed sequences disclosed in both of these references and elsewhere in the record is QPZ and QPZP, neither of which is tested. Furthermore, even if it is presumed that wash steps follow “Stage 1” and “Stage 2” in specification Example 1, there is no comparison involving the presence and absence of a washing step between a Z stage and a Q stage, regardless of the order of appearance in the sequence. Thus, on this record, in the absence of an explanation of the significance of the evidence presented, it is unclear whether the comparison in specification Example 1 involves a direct, or even an indirect, comparison with the closest prior art in a manner which addresses the thrust of the rejection under § 103. *See generally, In re Burckel*, 592 F.2d 1175, 1179, 201 USPQ 67, 71 (CCPA 1979) (“A Rule 132 affidavit, to be effective, must compare the claimed subject matter with the closest prior art.”); *In re Blondel*, 499 F.2d 1311, 1317, 182 USPQ 294, 298 (CCPA 1974).

The significance of the results, particularly Kappa number and Brightness, known in the art to be inversely related, and Viscosity have also not been explained. Indeed, the small differences in Kappa

number does not appear to be reflected in the Brightness data, see Backlund, e.g., Table 1, and even if is, there is little difference in Kappa numbers, both of which are in the range found to be acceptable in the art. See Backlund (e.g., col. 1, lines 8-10 and 19, col. 9, lines 16-17, and Table 2, QPZ and QPZP). The combined teachings of the references further suggest that the results obtained with respect to these properties are influenced by a wide variety of factors such as the type of wood, the manner in which it is oxygen-delignified and the number of stages. Also, the sequence used in Method 2 is not the extent of the claimed sequences, which include ZQPZ and ZQPZP, which are stated in the ground of rejection to be a modification of the known sequences QPZ and QPZP. Thus, even if the reported data is shown to be based on a proper direct or indirect comparison of the claimed invention and a “known” sequence, the evidence is not commensurate with the scope of the claims. *See In re Kulling*, 897 F.2d 1147, 1149-50, 14 USPQ2d 1056, 1058 (Fed. Cir. 1990); *In re Dill*, 604 F.2d 1356, 1361, 202 USPQ 805, 808-09 (CCPA 1979).

In the absence of an explanation, the single Q stage comparison in specification Example 2 does not directly or indirectly provide a comparison between the claimed invention and the closest prior art. Indeed, there is no explanation or evidence which provides a basis on which to extrapolate the data in Example 2 to the performance to be expected of the particular Q stage in any of the claimed sequences or in any of the prior art sequences. *See Burckel, supra; Blondel, supra.*

Accordingly, I have weighed all of the evidence of obviousness found in the combined teachings of Backlund, Lundgren and Lindberg with all of appellants’ countervailing evidence of and argument for nonobviousness and, therefore, I must conclude that, on the totality of the record, the claimed invention encompassed by the appealed claims would have been obvious as a matter of law under 35 U.S.C. § 103.

CHARLES F. WARREN
Administrative Patent Judge

) BOARD OF PATENT
) APPEALS AND
) INTERFERENCES

Appeal No. 1998-2077
Application 08/553,324

Appeal No. 1998-2077
Application 08/553,324

Farkas & Manelli PLLC
1233 20th Street, Suite 700
Washington, DC 20036-2396